

THAT WHICH IS CLAIMED:

1. A packaging device for a pill packaging apparatus, the packaging device being adapted to cooperate with a plurality of pill receptacles, the receptacles being defined by a web and being conveyed by a conveyor under the packaging device in a packaging direction, so as to manipulate pills deposited in the receptacles into a laid-down position with respect to the receptacles, said packaging device comprising:

a first wiper device extending across the web and non-perpendicularly to the packaging direction, the first wiper device being configured to engage pills protruding from the receptacles; and

a second wiper device disposed downstream of the first wiper device and extending across the web substantially perpendicularly to the packaging direction, the second wiper device being configured to engage any pills still protruding from the receptacles following engagement with the first wiper device, the first and second wiper devices being configured to oscillate substantially transversely to the packaging direction so as to vibrate laterally with respect to the web, the lateral vibration of the first and second wiper devices, as the wiper devices engage any protruding pills, thereby causing the protruding pills to be manipulated into the laid-down position in the corresponding receptacles.

2. A packaging device according to Claim 1 further comprising a plate supporting the first and second wiper devices, wherein the plate is configured to be transversely oscillated with respect to the web so as to laterally vibrate the first and second wiper devices.

3. A packaging device according to Claim 1 wherein first wiper device is disposed at an angle of about 45 degrees with respect to the packaging direction.

4. A packaging device according to Claim 1 further comprising a vibration-inducing device operably engaged with and configured to transversely oscillate the first and second wiper devices.

5 5. A packaging device according to Claim 4 further comprising a frequency controller operably engaged with the vibration-inducing device and configured to control a frequency of the transverse oscillation of the first and second wiper devices.

6. A packaging device according to Claim 4 wherein the vibration-inducing
10 device further comprises a pneumatic vibrator.

7. A packaging device according to Claim 2 wherein the plate defines a slot extending therethrough, the plate being further configured to removably receive at least one of the first and second wiper devices such that the at least one of the first and second
15 wiper devices extends through the slot so as to be capable of engaging the protruding pills.

8. A packaging device according to Claim 7 further comprising a support member operably engaged with the plate and disposed adjacent to the slot, wherein at
20 least one of the first and second wiper devices is configured to be removably engaged with the support member.

9. A packaging device according to Claim 8 further comprising a clip member configured to cooperate with the support member so as to removably secure at
25 least one of the first and second wiper devices to the support member.

10. A packaging device according to Claim 7 wherein the receptacles are arranged in columns in the packaging direction and the plate defines at least one channel opposing the web and extending along the packaging direction, the at least one channel
30 being further configured to have the slot extending thereacross so as to allow the at least

one of the first and second wiper devices extending therethrough to engage the protruding pills.

11. A packaging device according to Claim 2 further comprising at least one
5 vibration-dampening device operably engaged with the plate and adapted to substantially isolate the vibration produced by the oscillating plate from the conveyor.

12. A packaging device according to Claim 1 wherein at least one of the first and second wiper devices comprises a cloth.

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13. A packaging device for a pill packaging apparatus, the packaging device being adapted to cooperate with a plurality of pill receptacles, the receptacles being defined by a web and being conveyed by a conveyor under the packaging device in a packaging direction, so as to manipulate pills deposited in the receptacles into a laid-
15 down position with respect to the receptacles, said packaging device comprising:

a first wiper device extending across the web and non-perpendicularly to the packaging direction, the first wiper device being configured to engage pills protruding from the receptacles;

a second wiper device disposed downstream of the first wiper device and
20 extending across the web substantially perpendicularly to the packaging direction, the second wiper device being configured to engage any pills still protruding from the receptacles following engagement with the first wiper device; and

a plate extending across the web and supporting the first and second wiper
25 devices, the plate being configured to oscillate substantially transversely to the packaging direction so as to cause the first and second wiper devices to vibrate laterally with respect to the web, the lateral vibration of the first and second wiper devices, as the wiper devices engage any protruding pills, thereby causing the protruding pills to be manipulated into the laid-
30 down position in the corresponding receptacles.

14. A packaging device according to Claim 13 wherein first wiper device is disposed at an angle of about 45 degrees with respect to the packaging direction.

15. A packaging device according to Claim 13 further comprising a vibration-inducing device operably engaged with and configured to transversely oscillate the plate.

16. A packaging device according to Claim 15 further comprising a frequency controller operably engaged with the vibration-inducing device and configured to control a frequency of the transverse oscillation of the plate.

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17. A packaging device according to Claim 13 wherein the plate defines a slot extending therethrough, the plate being further configured to removably receive at least one of the first and second wiper devices such that the at least one of the first and second wiper devices extends through the slot so as to be capable of engaging the protruding pills.

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18. A packaging device according to Claim 17 further comprising a support member operably engaged with the plate and disposed adjacent to the slot, wherein at least one of the first and second wiper devices is configured to be removably engaged with the support member.

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19. A packaging device according to Claim 18 further comprising a clip member configured to cooperate with the support member so as to removably secure at least one of the first and second wiper devices to the support member.

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20. A packaging device according to Claim 17 wherein the receptacles are arranged in columns in the packaging direction and the plate defines at least one channel opposing the web and extending along the packaging direction, the at least one channel being further configured to have the slot extending thereacross so as to allow the at least one of the first and second wiper devices extending therethrough to engage the protruding pills.

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21. A packaging device according to Claim 13 further comprising at least one vibration-dampening device operably engaged with the plate and adapted to substantially isolate the vibration produced by the oscillating plate from the conveyor.

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22. A packaging device according to Claim 13 wherein at least one of the first and second wiper devices comprises a cloth.

23. A pill packaging apparatus adapted to package pills in a plurality of pill receptacles defined by a web, said pill packaging apparatus comprising:
10 a conveyor for conveying the web therealong in a packaging direction;
a feeder mechanism configured to deposit pills into the receptacles; and
a packaging device disposed downstream of the feeder mechanism with respect to the conveyor and configured to manipulate pills deposited in the
15 receptacles into a laid-down position with respect to the receptacles, said packaging device comprising:
a first wiper device extending across the web and non-perpendicularly to the packaging direction, the first wiper device being configured to engage pills protruding from the receptacles; and
20 a second wiper device disposed downstream of the first wiper device and extending across the web substantially perpendicularly to the packaging direction, the second wiper device being configured to engage any pills still protruding from the receptacles following engagement with the first wiper device, the first and second wiper
25 devices being configured to oscillate substantially transversely to the packaging direction so as to vibrate laterally with respect to the web, the lateral vibration of the first and second wiper devices, as the wiper devices engage any protruding pills, thereby causing the protruding pills to be manipulated into the laid-down position in
30 the corresponding receptacles.

24. A pill packaging apparatus according to Claim 23 wherein first wiper device is disposed at an angle of about 45 degrees with respect to the packaging direction.

25. A pill packaging apparatus according to Claim 23 further comprising a
5 vibration-inducing device operably engaged with and configured to transversely oscillate the plate.

26. A pill packaging apparatus according to Claim 25 further comprising a
frequency controller operably engaged with the vibration-inducing device and configured
10 to control a frequency of the transverse oscillation of the plate.

27. A pill packaging apparatus according to Claim 23 wherein the plate defines a slot extending therethrough, the plate being further configured to removably receive at least one of the first and second wiper devices such that the at least one of the
15 first and second wiper devices extends through the slot so as to be capable of engaging the protruding pills.

28. A pill packaging apparatus according to Claim 27 further comprising a support member operably engaged with the plate and disposed adjacent to the slot,
20 wherein at least one of the first and second wiper devices is configured to be removably engaged with the support member.

29. A pill packaging apparatus according to Claim 28 further comprising a clip member configured to cooperate with the support member so as to removably secure
25 at least one of the first and second wiper devices to the support member.

30. A pill packaging apparatus according to Claim 27 wherein the receptacles are arranged in columns in the packaging direction and the plate defines at least one channel opposing the web and extending along the packaging direction, the at least one
30 channel being further configured to have the slot extending thereacross so as to allow the

at least one of the first and second wiper devices extending therethrough to engage the protruding pills.

31. A pill packaging apparatus according to Claim 23 further comprising at
5 least one vibration-dampening device operably engaged between the plate and the conveyor and configured to substantially isolate the vibration produced by the oscillating plate from the conveyor.

32. A pill packaging apparatus according to Claim 23 wherein at least one of
10 the first and second wiper devices comprises a cloth.

33. A method for packaging pills in individual receptacles in a web being conveyed in a packaging direction, said method comprising:
depositing pills into the receptacles;
15 engaging a first wiper device with any pills protruding from the receptacles, the first wiper device being disposed non-perpendicularly with respect to the packaging direction;
engaging a second wiper device with any pills still protruding from the
20 receptacles following engagement with the first wiper device, the second wiper device being disposed substantially perpendicularly with respect to the packaging direction; and
oscillating the first and second wiper devices substantially transversely to the packaging direction such that the first and second wiper devices vibrate
laterally with respect to the web, the lateral vibration of the first and
25 second wiper devices, as the wiper devices engage any protruding pills, thereby causing the protruding pills to be manipulated into a laid-down position in the corresponding receptacles.

34. A method according to Claim 33 wherein engaging a first wiper device
30 further comprises engaging a first wiper device, disposed at an angle of about 45 degrees with respect to the packaging direction, with any pills protruding from the receptacles.

35. A method according to Claim 33 wherein oscillating the first and second wiper devices further comprises oscillating the first and second wiper devices substantially transversely to the packaging direction with a vibration-inducing device
5 operably engaged therewith.

36. A method according to Claim 35 further comprising controlling a frequency of the transverse oscillation of the first and second wiper devices with a frequency controller operably engaged with the vibration-inducing device.